

Hurd (H. M.)

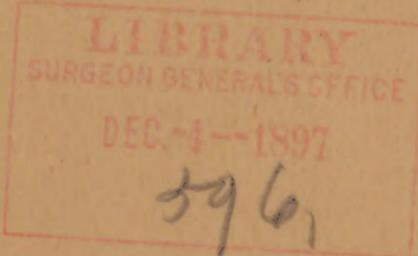
COMPLIMENTS OF
HENRY M. HURD

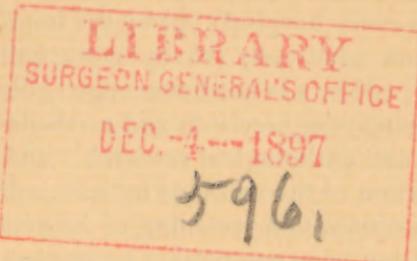
LABORATORIES AND HOS- PITAL WORK.

BY

Henry M. Hurd, M. D., LL.D., of
The Johns Hopkins Hospital.

Reprinted from
THE BULLETIN OF AMERICAN ACADEMY
OF MEDICINE,
Aug. 1896,
VOL. 2. NO. 8.





LABORATORIES AND HOSPITAL WORK.¹

BY HENRY M. HURD, M.D., LL.D., OF THE JOHNS HOPKINS HOSPITAL.

The ancient conception of the hospital has changed even in our days. Originally a hotel, a caravansary, an empty place for guests in the oriental significance, a mere stopping place, with little but shelter, without comforts, adequate bedding, proper furniture, proper food or any of the essentials for a sick-room, a place intended only for the friendless and homeless,—the modern hospital has become a well ordered, well-ventilated, thoroughly equipped abode for all classes of the sick, with accommodations alike for the dependent, the middle class and the wealthy. In well arranged operating rooms facilities exist for aseptic work far beyond the ability of wealth to procure in the homes of the rich; in specially constructed wards, luxuries and comforts are obtainable which render them eagerly sought for by those who desire medical treatment or important surgical operations. People of moderate means resort to hospitals also as furnishing better facilities for the comfortable treatment of common diseases like typhoid fever, pneumonia and malarial fever. For these reasons the former criticisms once so common in the medical profession and out of it upon the misleading re-

¹ President's address before the American Academy, Atlanta, May 2, 1896.

sults of hospital treatment of disease and upon the fallacious conclusions drawn from the observation of disease in hospitals are no longer valid. The statistics of hospitals and the results of their methods of treatment have been favorably modified during the past ten years by (a) a better hygienic condition prevailing in every hospital; (b) by the improved social condition of the patients admitted; (c) by more enlightened methods of treatment; (d) by a better knowledge of disease acquired by the use of instruments of precision and methods of accurate, precise diagnosis and pathological research; and (e) finally, by a better appreciation of the methods by which diseases spread in hospitals and a consequent lessening of hospitalism by preventing their extension from one patient to another.

One who has not kept himself in touch with hospital construction during the past twenty years can hardly appreciate the enormous strides which have been made by architects and hospital boards to furnish well constructed, well arranged, hygienically appointed and well equipped buildings for the accommodations of all classes of patients. In Montreal the Royal Victoria and the reconstructed Montreal General, the Childrens at Toronto, the City at Boston with its elaborate and separate contagious department; in New York the new St. Luke's, the reconstructed Presbyterian with its model operating amphitheatre, the Roosevelt with its Symes Operating Amphitheatre, Sloane Maternity and Vanderbilt Clinic, all closely affiliated with it, the New York with the House of Relief in Hudson Street; in Brooklyn the Methodist Episcopal; in Philadelphia the Pennsylvania and University of Pennsylvania; in Baltimore, the City, Maryland General and Johns Hopkins; the Garfield at Washington, the Buffalo General with its new wards, the Presbyterian in Chicago, the City and County at St. Paul, the Lakeside at Cleveland, the Grady in Atlanta; these and similar hospitals in well nigh every city, serve to emphasize the grand advance which has been made in hospital construction and to indicate the corresponding improvement which must have resulted in hospital statistics.

Improved buildings have materially changed the character of the patients who seek relief in hospitals. The poor, degraded,

homeless, hopeless outcast still receives relief and tender care and is not excluded by the industrious, self-respecting citizen who comes no less for the same care. The patient from the middle class who is able to pay and probably does pay, does not regard it unworthy of him to go to the hospital when suffering from a severe accident or from epidemic disease or to undergo a difficult surgical operation. Beyond this, many hospitals have wards erected for the wealthy who thus are able to avail themselves of sanitary appliances and antiseptic safeguards during surgical operations which are unattainable at home. Money even cannot purchase them at short notice. It hence follows that the average hospital population now represents as never before the average population of any community. It further follows that methods of treatment are more nearly uniform, and the practical deductions to be drawn from statistics give a juster view of the laws of disease and the results of treatment than formerly. In fact, in certain aspects of the case it would seem *a priori* that deductions made from hospital statistics more nearly represent the actual facts respecting diseases than those made from patients outside of hospitals. The latter represent all but the poorer classes of patients who are necessarily cared for in hospitals; the former represent all.

It is equally evident that the mingling of patients of the more prosperous classes with those who formerly resorted to hospitals has improved their dietary, their methods of treatment and especially the nursing and personal care of patients. Now that hospital care of the more prosperous classes of patients has become an imperative necessity, the neglect of the poorer classes in the same hospitals becomes impossible.

The influence of improved methods of diagnosis to give a clearer knowledge of disease is so evident as scarcely to require to be dwelt upon. It is proper, however, to refer to one or two illustrations. Take, for example, the dysenteric symptoms which follow an infection from the amoeba coli. Formerly, such symptoms were regarded as due to an entero-colitis of severe type to be treated by a list of unsatisfactory remedies which rarely gave relief. We know now why this treatment failed. It did not destroy the organism upon which the disease depended nor

did it inhibit its growth. We know now that injections of sulphate of quinia will relieve the condition and cure the patient. Until an accurate diagnosis was made of this condition, consistent, rational treatment was impossible. The relief of the symptoms did not remove the cause of the disease. It is equally true that a knowledge of the malarial plasmodium has rendered it possible to differentiate malarial from typhoid fever and thus to avoid the fatal error of treating a malarial fever as a typhoid, or the more common one of regarding a typhoid fever as malarial in character, and omitting the precautions which are so essential to safety.

Pathological and bacteriological researches have also contributed to a great degree to the more satisfactory treatment of disease. Witness, for example, the differentiation of diphtheria from ordinary forms of anginose disease of the throat, the discrimination of gonorrhœal from other forms of rheumatism; our certain knowledge of the treatment of myxœdema and congenital cretinism by the use of the thyroid extract, our knowledge of the dependence of so-called peritonitis upon specific infections like the bacillus coli communis or the streptococcus pyogenes, the differentiation of the toxic forms of neuritis from locomotor ataxia or general paresis, etc.

The wave of hospital improvement in America which followed the Civil War and largely grew out of the experience derived in that memorable struggle did not bring about changes so much in hospital methods, scientific or administrative, as changes in hospital construction. Pavilion hospitals, detached buildings for isolating contagious or infectious cases, greater air-space in the wards, improved systems of ventilation, better methods of heating,—these and many other similar improvements followed and constituted the first stage of hospital development which seems coming to a close. These better structures are now generally achieved throughout the country and we have reached a second and equally important stage of hospital evolution which will mark a new era by furnishing facilities for scientific work.

My plea is, that increased laboratory facilities should now be supplied to all hospitals to the end that more may thus be

done for the investigation and treatment of disease than can possibly be accomplished by any other agency.

First in importance, I would place the Clinical Laboratory which is now, I am gratified to say, an integral and necessary part of every large hospital. Here facilities should be provided for careful examination of the blood, sputum, urine, feces, stomach fluids, products of digestion, contents of abscess cavities and, in fact, every morbid product. These examinations should not alone be chemical or even microscopical, but the examiner should avail himself of the aid given by bacteriology and pathology. It is no longer sufficient to use the ordinary methods of differentiating between the white and red corpuscles of the blood, but the Ehrlich methods of staining with aniline dyes are absolutely essential to the proper diagnosis of the various forms of leukemia. The diagnosis of splenic myelogenous leukemia cannot be made without the use of such stains. The study of the manifold manifestations of human tuberculosis is equally dependent upon a proper staining and examination of the tubercle bacillus. In several instances, during the past year, the discrimination of the tubercle from the smegma bacillus has made a gratifying change in the prognosis given at the Johns Hopkins Hospital in apparently hopeless conditions. The great advantage of a knowledge of the malarial organism in the differentiation of the various forms of malarial from the other forms of continued fever has already been referred to, but at the risk of repetition, I cannot refrain from speaking more at length upon this interesting topic. The knowledge of the life history of the so-called plasmodium has demonstrated the manner in which malarial disorders arise, develop, give rise to the nervous phenomena known as a chill and pass off by febrile disturbance and has explained the phenomena very satisfactorily. An equally satisfactory demonstration exists in the method of cure wrought by quinia which comes so near to being a specific and the causes of its failure to cure when it fails. The history of typhoid fever is not as clearly written in the life history of the organism upon which it depends, but it is sufficiently distinct to enable a careful discrimination to be made in disputed cases. Hence the practitioner never should permit himself to be misled by the seduc-

tive term malarial influence to explain a condition which he does not clearly understand. If malarial influence does not depend upon the demonstrated presence of the plasmodium in the blood, it is more than probable that the condition has not a malarial causation and some other cause should be sought for. So also the presence of a continued fever with exacerbations and without the presence of the plasmodium should lead the physician to relinquish the thought of malarial causation and treat his patient as if he had to deal with a case of typhoid fever.

A knowledge of bacteriology is also of extreme value in the treatment of a large number of surgical affections by enabling the physician to understand and explain phenomena which are otherwise unintelligible. Take, for example, the old idea of air in the veins which was formerly supposed to be the cause of death in surgical operations. The demonstration was never clearly made but the clinical picture was a distinct one and the conception has dominated the professional mind for generations. It is now believed and can be demonstrated that the entire series of symptoms is due to the presence of an air-producing bacillus which finds its entrance when veins or other tissues are wounded by missiles or weapons infected with this bacillus. From evidence at present attainable it seems altogether probable that this organism is present in the air at all times and may infect during the passage through the atmosphere whatever produces a bodily injury.

Much has also been accomplished by bacteriology to clear up the former ideas of peritonitis. This disease was formerly believed to be an entity as well marked as typhoid fever or small pox. We now know that the term peritonitis may imply diverse conditions. It may be circumscribed in character and due to an appendicitis which can be relieved by an operation; it may be localized and due to a tubercular infection and finally it may result from the entrance of the bacillus coli communis, the common bacterium of the intestinal tract, into the peritoneal cavity. To speak of peritonitis now suggests the possibility of many widely differing conditions, requiring varied treatment and presenting often very different terminations.

Take as another illustration the mysterious and hitherto in-

explicable affection known as epidemic cerebro-spinal meningitis which has produced such serious havoc in many communities throughout the country. Researches made by competent observers since 1880 have demonstrated that this disease is dependent upon the presence of the *micrococcus lanceolatus*, the organism which is found in pneumonia, and which is thought to be a permanent occupant of at least 80 per cent. of the mouths of human beings. The work of bacteriologists in clearing up the causation of this dread disease has thrown much needed light upon a most difficult subject. It is true that thus far no practical outcome in the way of a better treatment has been found. Such improvement in methods of prevention or cure must surely come now that the causation of the disease is understood.

Similar statements might be made in regard to the important distinction now possible between gonorrhœal and other forms of rheumatism—distinctions which have revolutionized surgical practice and have already been the means of saving many useful joints. The joint is incised, irrigated with an antiseptic solution and closed up again with marked relief of pain and generally favorable results.

The diarrhoeal affections of children are now known to be due to the presence of bacteria in the intestines and this knowledge has already become a preliminary to successful treatment. Without a knowledge of bacteria and the careful painstaking investigation of the intestinal contents in children by systematic bacteriological work extending over a period of years, the present well settled line of treatment could not have been devised or placed upon a rational basis. Such bacteriological study has only been practicable in the clinical laboratories of well-organized hospitals.

The same is true of our present knowledge of the successful treatment of severe infections from the *streptococcus pyogenes* or the *bacillus aërogenes capsulatus*. A careful study of these infections demonstrated the fact that they could not be destroyed by irrigations however thoroughly made, and were alone to be removed by a continuous bath with such a free flow and discharge of water as would practically remove bacteria from the surface of the wound as rapidly as they grew. In this manner

they were washed off, and the infection of deeper tissues was prevented.

A clinical laboratory has lately been given to the University of Pennsylvania through the liberality of Dr. Pepper, which promises to be of untold benefit to the students of that renowned medical school. A liberal sum has also been presented to the Johns Hopkins Hospital for a similar laboratory for the students of the medical school. Would that equal liberality and wisdom on the part of others would render it possible to hope for similar laboratories in connection with every large hospital in the country.

Another adjunct to a hospital of great importance should be a pathological laboratory for the study and investigation of the products of disease, either found at autopsy or occurring in the usual course of hospital activity. In the monumental pathological atlases issued during the early part of the present century which excite our admiration by the patient industry and lofty scientific enthusiasm which they display, one cannot help a feeling of disappointment and regret that the practical results seem so inconclusive and unsatisfactory. The pathological work initiated by Virchow less than fifty years ago, is of a far different character and has revolutionized our conception of diseased processes within the human body. We are no longer satisfied with the representation of the gross appearances of a morbid product, but our art requires that we should know the nature of the deviation from the normal tissue, and become fully acquainted with its intimate, interior structure. The diseased tissue must consequently be studied in frozen sections; it must be hardened in various fluids and appropriately stained so that sections may show the microscopic appearances; if the tissue is from the nervous system the newer silver stains must be employed to bring out the nerve elements, the neurons, the dendrites, and the wonderful interlacings of nerve fibres which, until the discovery of the Golgi method, and the patient work of Cajal, Andriezen and Berkley in America to develop it were unknown to microscopists; it must be studied also by chemical and bacteriological methods no less until the hidden secret of the morbid process stands revealed to the pathologist. The work of a well-organ-

ized pathological laboratory should enable the physician and surgeon to trace the mutual relations of diseased processes, to indicate the sequence of the disease throughout the body, its point of entrance, its mode of destroying life in fatal cases or its mode of cure in those who recover. Such a laboratory becomes a court of last resort for the physician confirming his verdict in a given case, by showing the correctness of his diagnosis, or possibly as often reversing it by demonstrating the fallacious reasoning and erroneous conclusions upon which it was based. No form of review is so useful to the physician as the decisive finding of the autopsy table and no instruction more profitable to the genuine student of medicine than the lessons learned there. It is gratifying to learn that provision is now being made for the establishment of a pathological institute with a most liberal endowment in connection with a magnificent hospital now building in New York, because of a settled conviction on the part of its governing body that in no other way would the same outlay contribute so much to increase the efficiency and usefulness of the medical and surgical service of this hospital. Two leading hospitals in Boston within the past two years have expended large sums of money (raised in the case of one by public taxation) to erect and equip buildings for the study of pathology and to pay the salaries of competent pathologists. In both hospitals the step was taken after mature deliberation and a careful consideration of the whole question, because it was believed that the service of the whole hospital would be benefited by it. While I am writing, the newspapers announce that the sum of \$100,000 has been given by an unknown donor to promote the study of comparative pathology in connection with the Harvard Medical School in Boston. The State of New York has made a liberal appropriation for the establishment of a pathological laboratory to be used in connection with the State hospitals in New York. The time now seems not far distant when every hospital of good standing will have a pathological laboratory as a permanent feature. It is evident to all that systematic and widespread investigations of diseases are nowhere so practicable as in hospitals, because of the numbers collected there, and the facilities which exist for the study of the findings

in a large number of cases. I am glad to say that such investigations are not confined to hospitals, but that trained observers are springing up in every community who are accomplishing much useful pathological work in diseases all about them. Within a few months the excellent observations made by Harris, in Atlanta, and Wilson, of Birmingham, upon the *amœba coli* have attracted attention and have demonstrated the opportunities which exist everywhere, to add to our knowledge of the etiology of diseases hitherto regarded mysterious. Great encouragement should come to scientific workers from the movement lately initiated in America, which, it is hoped, will become universal to appoint salaried trained pathologists in connection with hospitals, and by making them residents to give them a recognized official position and standing. This will in many instances require largely increased endowments for hospitals which ought to be forthcoming, since upon the studies of these laboratories rests our best hope of settling vexed questions about disease, its true pathology and proper treatment. These problems are numerous and we seem to be upon the threshold of their solution. Let me indicate a few of the most important. The assumed parasitic origin of cancer, its mode of invasion and its possibility of cure by streptococcus-cultures—these questions are clamoring for immediate answer. The pathology of insanity also seems to be nearer solution by the newer methods of investigation of nerve tissue. The field has hitherto seemed barren notwithstanding many years of patient cultivation, but better results are promised. The pathology of many forms of diseases of the skin is little known and their study by a trained observer must unquestionably give rich results. The pathology of all inward secretion in the light of what we know to be accomplished by thyroid feeding also deserves reinvestigation and special study. The curative influence of the antitoxin of diphtheria suggests an equal boon from an investigation of scarlet fever and measles. These are a few out of many fields of investigation which might be mentioned.

I would also have in connection with each pathological laboratory a room for experimental work in surgery—a surgical "proving-ground" to use an army phrase—where studies could

be made upon wound infection, the repair of injuries, intestinal suture, thyroid extirpation, ureteral suture, extirpation of the kidney, gastrostomy and gastrotomy, cholecystectomy and other equally serious operations. Here also careful studies could be made in skin disinfection, hand disinfection, sterilization of ligatures and dressing, and all the accompaniments of antiseptic work. In this manner surgeons and gynecologists could be kept fully in touch with all procedures calculated to improve their technique or to assist in devising new operations. I am aware that it is common to decry the practical results of operations upon the lower animals. It cannot be denied, however, that many of the most important surgical procedures which have made the past ten years so glorious, have been rendered possible through this form of experimentation. Our knowledge of wound infection, intestinal suture, extirpation of the kidney, ureteral anastomosis, thyroid removal, partial or complete, have thus been vastly increased. I would not, under any circumstances countenance the wanton infliction of pain, the synonym of which is cruelty, but I believe experimentation upon the lower animals absolutely necessary for the proper development of surgery. To hold our hands from these experiments, from fear of inflicting necessary pain upon dumb animals is to hold human life cheaper than the life of the brute. Such experimentation should be made by the use of anesthetics and with every precaution to inflict no needless pain. Rightfully and properly performed the study of the processes of injury and repair can be made most profitably in this manner.

The science of medicine in America to-day needs not practitioners or teachers as much as skilled, well-trained workers, better facilities for scientific work, and a more generous recognition on the part of the profession of the value and true importance of this work. Hospitals need larger endowments; the terms of service of those who hold positions upon the medical and surgical staff should be more permanent; the results of experience on the part of medical officers being better utilized by a more continuous service. In some hospitals, owing to the requirements of a so-called rotation in service, the terms of hospital service of physicians and surgeons are too short to permit

harmonious and concerted effort to give uniformity to records, similarity of methods in studying disease, or the greatest economy of supplies and appliances in operations. If a general hospital is the best field for the study of diseases its facilities should be utilized to the utmost. Appointments to the staff should not be regarded as honors simply, but rather as imperative calls to duty and to fresh effort to investigate disease. The record which has been made by members of the staffs of our American hospitals in the past has been most honorable. All praise to those self-sacrificing men who without govermental recognition or pecuniary reward have labored earnestly in hospital work and have done so much to advance medicine and surgery. Some have contended with overwhelming obstacles in the way of inadequate endowments, poor equipments, insufficient accommodation and often, indeed, scant courtesy on the part of governing bodies. They have builded wisely and well, notwithstanding the difficulties which have beset their pathway, and American hospitals through their efforts are now generally prepared to enter upon the new era of scientific investigation of which I have spoken.

One of the most hopeful signs of our times is the fact that many able men are coming forward to devote themselves to lives of scientific investigation in medicine. They are fully aware that the compensation which they can hope for is insignificant as compared with the emoluments of a successful career in medicine, surgery or gynecology. Filled with an enthusiasm for scientific research, they are filling our laboratories and are fitting themselves to solve the problems which lie all about us. It is gratifying to know that the services of well trained pathologists and bacteriologists are in demand, and that laboratory positions of great usefulness and importance are unfilled because fully trained men are not immediately available. The future teachers of medicine must come largely from those who have been proficient in laboratory work. It is gratifying to reflect that the members of the American Academy of Medicine who have always been striving for the higher education of members of the profession now feel that in the great advance which is made in medi-

cal education their occupation is well nigh gone and they must turn aside to sociological and educational matters.

The possibilities of the future of our profession are inspiring and stimulating. We are on the threshold of new discoveries in means of diagnosis, in the pathology of disease and in new and successful methods of treatment. To add even in the humblest manner to our means of detecting disease, to shed new light upon the character of disease and its mode of development and finally to increase our means of successfully treating disease should be our constant aim.



